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**SAFETY ELEMENT**  
(Including Seismic Safety)

**1.0 INTRODUCTION**

A mandated Element of the General Plan is the Safety Element. This Element addresses all potential safety hazards in the Community including seismic safety issues.

The development of a community, no matter how carefully undertaken, will cause safety hazards. Some of these hazards have been identified by the citizens of the community.

**2.0 POLICE PROTECTION**

An increase in population virtually assures increases in problems related to law enforcement, traffic, and crime that accompanies the increase in opportunities. Measures can be taken to reduce these impacts on police service; two of these measures are:

a) To consider "defensible space" as a factor in review of discretionary plans. Defensible space is a concept of considering design to inhibit crime by utilizing the proprietary concerns of residents. Key ingredients in designing defensible space includes:

i) Improving the natural capacity of residents to visually survey the public areas of their environment;

ii) Enhancing spheres of territorial influence within which residents can easily adopt a proprietary attitude;

iii) Improve public safety through the strategic geographical location of intensively used community facilities.

b) To continually monitor and seek means of reducing traffic accidents through proper enforcement and accident prevention programs.

**3.0 FIRE PROTECTION**

Community development increases problems related to fire protection. The community street system, in addition to carrying traffic, must also serve emergency vehicles. The effectual location of fire stations depends on the flexibility of street movement to reduce response time for fire and ambulance calls. Many problems have been and can further be averted through adequate preventive programs. The City policy shall be to:

a) Continue to strive to coordinate fire code inspections in concert with building inspections and other city inspections where appropriate;

b) Consider built-in fire protection as a cost effective integral factor in building design in respect to automatic sprinkler systems, early fire detection and alarm systems, adequate



fire exiting, use of fire resistant materials, and availability of easily accessible emergency reporting systems;

c) Reduce the impact on community fire protection defenses through limitation of required fire flows and potential fire losses;

d) Maintain a public education and awareness program to abate all fire and safety hazards in the community.

e) Strive to improve the fire flow through cooperative actions with the Twentynine Palms Water District.

#### **4.0 CIVIL DEFENSE**

In the case of major disaster, the citizens of the community will need to be well prepared and oriented if chaos is to be avoided. The continued functioning of both police and fire during any catastrophe must be assured. The most probable events that would have a disruptive effect on the community are: radiation accident, major transportation accident (such as an airplane crash), major fire, explosion, collapse of a public building during occupancy, and/or earthquake, flash flood or landslide of major consequence.

To cope with the noted potential disasters, should they occur, the following policies are established:

a) Through proper preparation, assure that all emergency services can maintain continued operations in the event of disaster. This operation should be through existing facilities if possible; or if not possible, through emergency temporary facilities;

b) Emergency hospital facilities should be able to be established in public buildings, such as schools, for the duration of the emergency.

c) Evacuation routes shall be established for present and future street systems to facilitate quick movement of people out of dangerous areas.

d) Civil defense and disaster plans shall be coordinated with all appropriate jurisdictions including neighboring communities, public utility agencies, the Combat Center, and County, State and Federal agencies. This coordination would permit the Twentynine Palms community to use its emergency facilities for assisting neighboring jurisdictions that are stricken by an unfortunate disaster or, conversely, using neighboring facilities for disasters that occur in the City.

e) The City shall identify all areas of flood hazard and demarcate them for the purpose of disaster and flood insurance qualification.

f) Emergency contingency plans shall assure an adequate supply of potable water for human consumption and a sufficient supply of water available for fire protection in the case of disaster.

g) Public programs exhorting cooperation and appropriate civil conduct in the case of disaster shall be formulated. Standard means of communication shall be established.



f) Establish programs to train volunteer groups to augment community safety personnel in the case of disaster.

g) Develop a comprehensive civil defense plan establishing responsibility for each phase noted in these policies and conduct tests of simulated disasters that could potentially occur.

## **5.0 DANGEROUS BUILDING ABATEMENT**

In addition to being an "eye sore", abandoned buildings provide an attractive nuisance for vandalism and unlawful activity. When in a state of sufficient deterioration, these structures pose a danger as well as a nuisance. The City of Twentynine Palms has a program of dangerous building abatement. The City should, through experience, enhance this program by promoting cooperative efforts between City Building Officials, Fire Department Inspectors, Police and City Code Compliance staff to identify and abate the hazards associated with dangerous buildings.

## **6.0 TRASH, REFUSE, JUNK AND OTHER NUISANCES**

The illegal accumulation of trash, refuse, garbage, etc. can constitute a safety hazard in that vectors, vermin and bacteria can quickly be associated with this situation. The City program should continue with increased coordination with County Health Officials and other involved parties; for example, the state in the case of hazardous materials.

## **7.0 SEISMIC SAFETY**

The Seismic Safety Element identifies and evaluates seismic hazards which pose a potential threat to public safety in the community. These hazards include: surface ruptures, ground shaking, ground failures, seismic induced waves (although unlikely in the desert), mud slides, landslides and slope stability. Not all of these hazards would affect the Twentynine Palms community but, since these items are required to be addressed by state law, they will be mentioned so as not to imply that they were overlooked.

The state of California, pursuant to the Alquist-Priolo law has provided the City with maps indicating the "active" earthquake faults in the community. Other seismic data are available from previously prepared Environmental Impact Reports prepared for various projects in the community.

The Seismic Safety section of this Element, by considering geologic and seismic hazards, will act as a guide in directing the development of the City to reduce loss of life, injuries, damage to property and economic and social dislocations.

The scope of this section of the Element identifies seismic hazards in the Twentynine Palms planning area, establishes goals and objectives for seismic safety and an action program for implementation of policies to reduce the hazards.



## 7.1 Findings

### 7.1.1 Primary Seismic Hazards

Faults. There are two significant faults crossing the community; the Pinto Mountain fault and the Mesquite Lake fault. Although not major faults, movement along either of these faults could do extensive structural damage and could possibly alter the water table.

### 7.1.2 Secondary Seismic Hazards

Ground Shaking An earthquake on the Mesquite Lake fault is capable of reaching the magnitude of 6.7 on the Richter scale. The peak horizontal bedrock acceleration produced at the site by a seismic event of this magnitude is estimated to be 0.64g.\*1 Equivalent data are not available for the Pinto Mountain fault, but the impacts should be similar to the Mesquite Lakes fault.

Ground Failures. The extent of structural damage from earthquake vibrations is determined by (1) the characteristics of the underlying soils and/or rocks; (2) the design of the structures; (3) the quality of materials and workmanship employed in construction; (4) the location of the epicenter and magnitude of the earthquake, and (5) the duration of ground shaking. The potential for structural damage is greatest in areas underlain by deep, soft, saturated soils and least in areas of hard bedrock.

Tsunami and Seiche. Due to the inland location of the City of Twentynine Palms and the absence of any significant body of water, the danger or hazard related to this category is implausible.

Slope Stability. There is a hazard from ground shaking during an earthquake as rock slides can occur off of the mountains and hills in or abutting the community. Depending on the seismic circumstance, a potential rock slide could cause major damage to any structure (or person) in its way.

Flood Plain Drainage. Due to the climate and alluvial fan situation, there are defined areas that are at risk for flash flooding. This hazard can be mitigated by the establishment of designed flood control receptors and channels. In this manner, the "sheet flows" can be better controlled. Other dry lake beds are well defined.

\*1 Ninyo & Moore, "Geology/soil conditions/ seismicity"; The Gateway Specific Plan, Coleman Planning Group, 1990.

## 8.0 TRAFFIC SAFETY

One of the most serious safety problems in any inhabited area is that of traffic safety. Most of the problems are human behavior problems which can only be corrected through enforcement and/or education. However, the City can reduce the loss of life and



property through elimination or mitigation of natural or created hazards identified in the Community.

## **9.0 SUMMARY**

a) The earthquake fault zones are identified on the Alquist Priolo maps; the remainder of the community is in relatively satisfactory location for development pursuant to the General Plan, all other things considered equal.

b) The City has significant hazard from flash floods, particularly in the alluvial fans but not necessarily limited to that area.

c) There is a hazard of rock slides during a seismic event.

d) There are hazards related to un-reinforced masonry buildings that would be confirmed during a seismic event.

## **10.0 COMMUNITY POLICIES**

### **10.1 Seismic Safety Policies**

a) To prohibit construction of any habitable structures within fifty (50) feet of a known fracture.

b) To require a signature of a structural engineer on all plans of buildings within five hundred (500) feet of an earthquake fault outside of the prohibited area identified in (a). At least three (3) test trenches should be dug for any major proposal in this fault zone.

c) Scrutinize all development to assure that unnecessary hazards are not created by architectural features.

d) Seismic hazards, when identified and verified, shall be public information and appropriate admonition against development, within the scope of this hazard, shall be given to prevent future disasters and protect the City from liability.

e) Necessary measures shall be taken to assure that all emergency services can function during a seismic disaster.

f) A public awareness program shall be maintained and procedures established to reduce the impacts of seismic disasters.

### **10.2 Acceptable Risk**

The City should periodically evaluate the safety situation and determine an appropriate level of acceptable risk. An acceptable risk is defined as that level where further community action is not necessary or required under the circumstances to protect life and property from safety hazards.

### **10.3 Flood Plain and Drainage Policies**

a) The City program is to continue to coordinate with County, State and Federal authorities to continuously refine and update the information on flooding and drainage.

b) The City will endeavor to update FEMA maps for the



Community for flood insurance purposes.

c) The City will adopt special development regulations for property in the identified flood zones.

d) Development proposals will be encouraged to leave flood zone areas open and cluster the development on areas free from flood hazard.

e) Drainage areas shall, whenever possible, remain in a natural open condition; when a channel is required for public safety, the design should be such to minimize the disruption of an area.

#### 10.4 Slope and Grading Policies

a) The intent is to account for a minimum disruption and alteration of the hillsides while accommodating permitted development.

b) Cut and fill slopes shall be stabilized to prevent erosion.

c) Grading permits should only be issued in conjunction with Building Permits; lot clearing and grading should only be to the extent necessary to accommodate an approved development project.

d) The City development guidelines shall consider "slope" as a controlling factor with the degree of development intensity inversely proportional to the degree of slope; the categories of uses are defined as follows and related to various slope categories on Table I:

i. "Permitted Uses" are those uses, that from a slope analysis point of view (assuming zoning and other conditions are favorable), are appropriate developments within the stated category.

ii. "Special Uses" are those uses that may be permitted in a slope category if the developer takes precautions to prevent potential problems. Specific development review and assessment of the slope situation by an Environmental Impact Study by a qualified expert is necessary to assure the integrity of the property prior to approval.

iii. "Prohibited Uses" means that these uses are generally determined to be incompatible with the slope category identified. Prohibited Uses may, however, be permitted if justified by the conclusions of an impartial Environmental Impact Study.

#### 11.0 SAN BERNARDINO COUNTY ELEMENT

This Safety Element also makes reference to the San Bernardino County "Seismic and Public Safety Element" adopted in 1975, wherein material contained therein referring to desert areas is applicable as advisory information except when in conflict with this City document.



TABLE I

## SLOPE - LAND USE MATRIX

PERCENT SLOPE	PERMITTED USES	SPECIAL USES	PROHIBITED USES
0-5	Agricultural, Industrial, Commercial, All Residential Uses, Institutional-Public Uses	Very High and High Density Residential	None
6-10	Low to Medium Density Residential, Agricultural	Neighborhood Commercial, High Density Residential, Medium High Density Residential, Institutional Uses	General Industrial, Very High Density Residential, General Commercial
11-15	Low and Medium Low Density Residential, Agricultural	Institutional Uses, Medium Density Residential	All Industrial, And Commercial, Very High, High and Medium High Density Residential
16-25	Agricultural, Low Density Residential, Open Public Uses	Institutional Uses,	All Industrial and Commercial, Medium Low to Very High Density Residential
Over 25	Open Space	Agricultural, Recreational Very Low Density Residential	All Other Uses



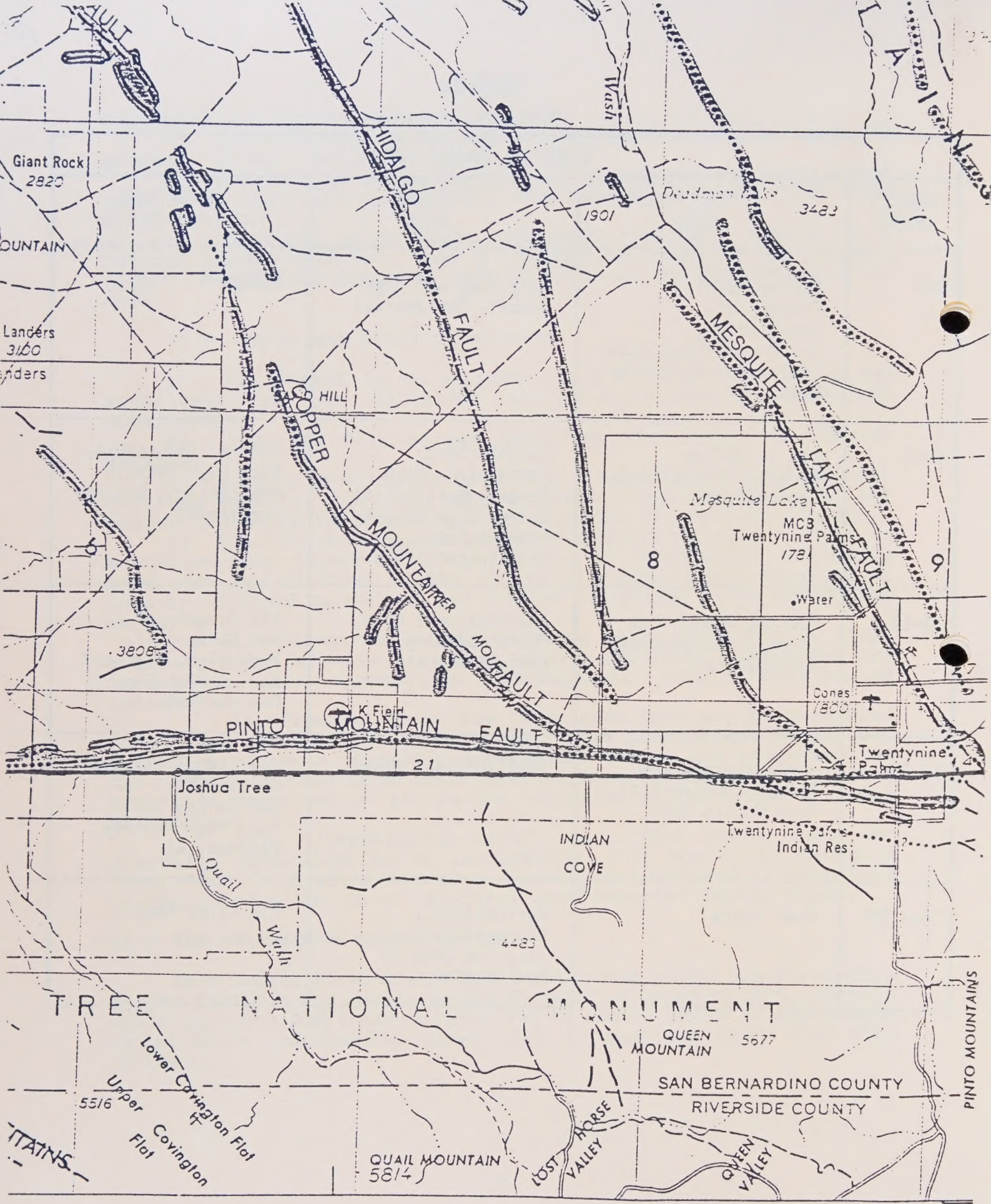




TABLE VI

SLOPE STABILITY RELATED TO DEVELOPMENT

<u>DEVELOPMENT ACTIVITY</u>	<u>POTENTIAL STABILITY HAZARDS</u>	<u>MEASURES TO MINIMIZE STABILITY HAZARDS</u>
Excavation and Grading	undercut slopes oversteepened slopes fill placed on slopes placement of uncompacted fill	minimal excavation and grading wherever possible cut and fill slopes 2:1 or flatter depending on analysis of local conditions key compacted fill into underlying materials
Removal of Vegetation	increased saturation of soils and rocks increased surface runoff accelerated erosion and sedimentation	leave vegetation intact wherever possible plant appropriate vegetation on slopes and cleared areas
Alteration of Drainage	natural drainage concentrated in restricted areas concentrated rainfall runoff from impervious surfaces (roofs, pavements, etc.) resulting in local accel- erated erosion and sedimen- tation locally increased saturation of soils and rocks from lawn watering, septic tank leach fields, swimming pools, etc.	design around natural drainage wherever possible divert surface runoff away from slopes into natural or constructed drainage channels design drainage systems with weirs, check dams, and settling basins install subsurface drains where necessary minimal construction of impervious pavements locate leach fields, etc. away from steep slopes
Construction	inappropriate location of buildings, swimming pools, etc.	design and locate structures in accordance with properties of underlying soils and rocks, considering weight loading and water saturation effects locate structures away from steep slopes





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